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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/700,590	04/16/2001	Y. Tom Tang	PF-0526 USN	7556

27904 7590 03/25/2003

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EXAMINER
SEHARASEYON, JEGATHEESAN

ART UNIT	PAPER NUMBER
1647	

DATE MAILED: 03/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Pluecky.

Office Action Summary	Application No. 09/700,590	Applicant(s) TANG ET AL.	
	Examiner Jegatheesan Seharaseyon	Art Unit 1647	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 December 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *21-40* is/are pending in the application.

4a) Of the above claim(s) *21,22,30 and 32-40* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *23-29 and 31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *15* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

1. Applicant's election with traverse of Group II claims 23-29 and 31(replacing original claims 3-6 and 9-14) in Paper No. 14 (12/23/02) is acknowledged. Applicant has also elected prosecute polynucleotide sequence encoding the polypeptide of SEQ ID NO: 22, which includes SEQ ID NO: 101. Applicant has further elected to cancel the original claims 1-20 and replace them with claims 21-40 that are pending. Applicant's remarks have been considered but are not found to be persuasive with respect to the unity of invention. Applicant traverses the restriction on the premise that the unity of invention standard was not applied in the national stage. Example 17 of the PCT Administrative instructions states that DNA and proteins are linked by a special technical feature when the claims are drafted as:

1. Protein X.

2. DNA encoding Protein X.

DNA and protein may be searched and examined together in PCTs and 371s if the claim set is drafted in Example 17's format and if the DNA and protein are both free over the prior art. However, in the instant application the original claims 1, 2 and 15 belonging to Group I encompassed fragments and variants, were not free over prior art. AA779652 and AA447814 had identity over portions of SEQ ID NO: 1 thus anticipating the fragments and variants recited in the claims. Therefore, claims are not so linked by a special technical feature within the meaning of PCT Rule 13.2 so as to form a single inventive concept and lack of unit is maintained. Thus, it is proper to separate the protein claims and the DNA claims. In addition, in the absence of common core

sequence searching more than one sequence would result in undue search burden on the Office. Therefore, the restriction requirement is deemed proper and made FINAL. Therefore, claims 23-29 and 31are under consideration.

2. Examination of claims 23-29 and 31will be limited to SEQ ID NO: 22.

Claim Objections

3a. Claims 23-29 and 31 are objected to because they recite multiple inventions (including those non-elected). Applicant is required to amend the claims to recite only the elected invention, specifically to the elected nucleotide sequence encoding SEQ ID NO: 22.

3b. Claims 23, 24 and 28 objected to because of the following informalities: These claims are dependent on non-elected invention. Appropriate correction is required. For the purpose of examination, the limitations of the non-elected inventions will be read into the claims.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 23-29 and 31 are rejected under 35 U.S.C. 101 because the claimed invention is not supported by either a specific and substantial asserted utility or a well established utility.

The instant claims are directed to polynucleotide encoding a polypeptide of SEQ ID NO: 22 belonging to a human transmembrane protein (pages 10-13). These claims are drawn to an

invention with no apparent or disclosed patentable utility. The instant application has provided a partial description of the isolated protein in the form of a predicted amino acid sequence. However, the application does not disclose the physical or structural properties of this protein. In addition, the instant application does not disclose the biological role of this protein or its significance.

It is clear from the instant specification that the claimed nucleotides encode peptides that have consensus sequences or specific domains that are *homologous* to nucleotides of various protein families based on various analytical methods including BLAST and PRINTS (see Tables 1-4, pages 72-105). However, the homology of a peptide is not a reliable indicator for the functional characteristics (see Scott et al. 1999). Even if proteins share considerable homology because of their evolutionary origins they often do not share any functional homology. There is little doubt that, after complete characterization, this protein will probably be found to have a patentable utility. This further characterization, however, is part of the act of invention and, until it has been undertaken, Applicants' claimed invention is incomplete.

The instant situation is directly analogous to that of which was addressed in *Brenner v. Manson*, 148 U.S.P.Q. 689 (Sus. Ct, 1966), in which a novel compound which was structurally analogous to other compounds which were known to possess anticancer activity was alleged to be potentially useful as an antitumor agent in the absence of evidence supporting this utility. The court expressed the opinion that all chemical compounds are "useful" to the chemical arts when this term is given its broadest interpretation. However, the court held that this broad interpretation was not the intended definition of "useful" as it appears in 35 U.S.C. 101, which

required that an invention must have either an immediate obvious or fully disclosed "real-world" utility. The court held that:

> "The basic quid pro quo contemplated by the Constitution and the Congress for granting a patent monopoly is the benefit derived by the public from an invention with substantial utility," "[u]nless and until a process is refined and developed to this point - where specific benefit exists in currently available form - there is insufficient justification for permitting an applicant to engross what may prove to be a broad field," and "a patent is not a hunting license," "[i]t is not a reward for the search, but compensation for its successful conclusion."

The instant claims are drawn to polynucleotides, which have a yet undetermined function or biological significance. Applicants have disclosed that they are in possession of a polynucleotide encoding an allegedly novel protein of SEQ ID NO: 22. However, there is no actual and specific significance that can be attributed to said novel polypeptides or the nucleotides identified in the specification, except the prophetic recitation of potential uses, which include the use in diagnosis, treatment, or prevention of immune, reproductive, smooth muscle, neurological, gastrointestinal, developmental, and cell proliferative disorders (page 23, lines 26-30). Furthermore, the nucleotides of the instant invention cannot be linked to a disease state or treating diseases listed in page 37, line 25 to page 40, line12. For these reasons, the instant invention is incomplete. Since, neither the prior art nor the specification provides for the physiological significance of the disclosed and claimed novel nucleotides encoding the proteins, there is no immediately obvious patentable use for it. In addition, the instant specification does not disclose a "real-world" use for said polynuleotides, except the prophetic recitation of potential uses, which include possible biological and therapeutic uses. Also, there are no working examples that demonstrate any specific utility. Thus, the claimed invention is incomplete and, therefore, does not meet the requirements of

35 U.S.C. 101 as being useful. Therefore, the polynucleotide of the invention is not supported by a specific and substantial asserted utility or a well-established utility.

Claim Rejections - 35 USC § 112, first paragraph

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5a.Claims 23-29 and 31 are also rejected under 35 U.S.C. 112, first paragraph. Specifically, since the claimed invention is not supported by either a specific and substantial asserted utility or a well established utility for the reasons set forth above, one skilled in the art clearly would not know how to use the claimed invention.

5b. Even if the Applicant was able to establish specific and substantial asserted utility or a well established utility claims 23, 24 and 26-29 and 31 would be rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention, and as containing subject matter which was does not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention in a manner commensurate in scope with these claims.

The specification discloses the nucleotide encoding SEQ ID NO: 22, which includes sequence of SEQ ID NO: 101. This meets the written description provisions of 35 USC 112, first paragraph. However, the specification does not disclose a nucleic acid molecules encoding a polypeptide that is consisting of a amino acid sequence which is at least 90% identical to the amino acid sequence of SEQ ID NO: 22 or nucleic acid molecules encoding a polypeptide that is consisting of a amino acid sequence which is a biologically active fragment of the polypeptide sequence of SEQ ID NO: 22 or nucleic acid molecules encoding a polypeptide that is consisting of a amino acid sequence which is an immunogenic fragment of the polypeptide sequence of SEQ ID NO: 22. The claims as written, however, encompass nucleotide sequences which were not originally contemplated and fail to meet the written description provision of 35 USC 112, first paragraph because the written description is not commensurate in scope with the recitation of claim 23, 24 and 26-29 and 31. The specification does not provide adequate written description to support the genus encompassed by the instant claims.

Vas-Cath Inc. v. Mahurkar, 19 USPQ2d 1111, makes clear that "applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession *of the invention*. The invention is, for purposes of the 'written description' inquiry, *whatever is now claimed*." (See page 1117.) The specification does not "clearly allow persons of ordinary skill in the art to recognize that [he or she] invented what is claimed" (*See Vas-Cath* at page 1116).

With the exception of the nucleotide encoding SEQ ID NO: 22, which includes sequence of SEQ ID NO: 101, the skilled artisan cannot envision all the detailed chemical structure of the claimed nucleic acid sequences, regardless of the complexity or simplicity of the method of isolation.

Adequate written description requires more than a mere statement that it is part of the invention and reference to a potential method for isolating it. The polypeptide itself is required. See *Fiers v. Revel*, 25 USPQ2d 1601, 1606 (CAFC 1993) and *Amgen Inc. V. Chugai Pharmaceutical Co. Ltd.*, 18 USPQ2d 1016. One cannot describe what one has not conceived. See *Fiddes v. Baird*, 30 USPQ2d 1481, 1483. In *Fiddes v. Baird*, claims directed to mammalian FGF's were found unpatentable due to lack of written description for the broad class.

Therefore, only the nucleotide encoding SEQ ID NO: 22, which includes sequence of SEQ ID NO: 101, but not the full breadth of the claims meets the written description provision of 35 USC 112, first paragraph. The species specifically disclosed are not representative of the genus because the genus is highly variant. As a result, it does not appear that the inventors were in possession of various polypeptide sequences set forth in claims 23,24 and 26-29 and 31.

Applicant is reminded that *Vas-Cath* makes clear that the written description provision of 35 USC 112 is severable from its enablement provision. (See page 1115.) Applicants are directed to the Revised Interim Guidelines for the Examination of Patent Applications Under the 35 U.S.C. 112, ¶ 1 "Written Description" Requirement, Federal Register, Vol. 64, No. 244, pages 71427-71440, Tuesday December 21, 1999.

5c. In addition, if utility were established for nucleic acid encoding SEQ ID NO: 22, claims 23, 24 and 26-29 and 31 would be rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The test of enablement is not whether any experimentation is necessary, but whether, if experimentation is necessary, it is undue. See *In re Wands,* 858 F.2d at 737, 8 USPQ2d at 1404. The factors to be considered when determining whether there is sufficient evidence to support a determination that a disclosure does not satisfy the enablement requirement and whether any necessary experimentation is "undue" include, but are not limited to: (1) the breadth of the claims; (2) the nature of the invention; (3) the state of the prior art; (4) the level of one of ordinary skill; (5) the level of predictability in the art; (6) the amount of direction provided by the inventor; (7) the existence of working examples; and (8) the quantity of experimentation needed to make or use the invention based on the content of the disclosure.

The instant claims read on the nucleic acid molecules encoding a polypeptide that is consisting of a amino acid sequence which is at least 90% identical to the amino acid sequence of SEQ ID NO: 22 or a nucleic acid molecules encoding a polypeptide that is consisting of a amino acid sequence which is a biologically active fragment of the polypeptide sequence of SEQ ID NO: 22 or a nucleic acid molecules encoding a polypeptide that is consisting of a amino acid sequence which is an immunogenic fragment of the polypeptide sequence of SEQ ID NO: 22. However, other than the nucleotide encoding SEQ ID NO: 22, which includes sequence of SEQ ID NO: 101, the specification as filed fails to disclose any other polypeptide sequences.

Despite knowledge in the art for producing homologues of a given protein with nucleotide deletions, insertions or subtitutions the specification fails to provide any guidance regarding the changes/modifications contemplated and yet retain the function

of the protein. Furthermore, detailed information regarding the structural and functional requirements of the disclosed protein is lacking. Certain positions in the sequence are critical to the protein's structure/function relationship, e.g. such as various sites or regions directly involved in binding, activity and in providing the correct three-dimensional spatial orientation of binding and active sites. These or other regions may also be critical determinants of antigenicity. These regions can tolerate only relatively conservative substitutions or no substitutions (see Wells, 1990; Ngo et al., 1994). Although it is accepted that the amino acid sequence of a polypeptide determines its structural and functional properties, predicting a protein's structure and function from mere sequence data remains an elusive task. Therefore, predicting which homologues would retain the functions of the protein is well outside the realm of routine experimentation. Thus, undue amount of experimentation would be required to generate changes/modifications contemplated and yet retain the function of the proteins claimed.

Applicants have not taught how one of skill in the art would use the full scope of polypeptide sequences encompassed by the invention of claims 23, 24 and 26-29 and 31. The specification as filed does not sufficiently teach one of skill in the art how to make and/or use the full scope of the claimed sequences. The amount of experimentation required to make and/or use the full scope of the claimed sequences would require trial and error experimentation to determine the functional sequences. Given the breadth of claims 23, 24 and 26-29 and 31, in light of the unpredictability of the art as determined by the lack of working examples and shown by the prior at of record, the level of skill of the artisan, and the lack of guidance provided in the instant

specification, it would require undue experimentation for one of ordinary skill in the art to make and use the claimed invention.

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Fletcher, C. A. et al. BRD4 Bromodomain Gene Rearrangement in Aggressive Carcinoma with Translocation t (15;19), (December, 2001), Am. J. Pathol. 159, pp 1987-1992. BRD4 has 99.2% sequence identity over SEQ ID NO: 101, a polynucleotide sequence encoding the polypeptide of SEQ ID NO: 22.

7. No claims are allowable.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jegatheesan Seharaseyon whose telephone number is 703-305-1112. The examiner can normally be reached on M-F: 8:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Kunz can be reached on 703-308-4623. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-0294 for regular communications and 703-308-4227 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0196.

JS
March 20, 2003

Lorraine Spector

LORRAINE SPECTOR
PRIMARY EXAMINER